The Corporation of the City of Kawartha Lakes

Council Report

Report Number WWW2020-004

Meeting Date: July 28, 2020

Title: Sanitary Sewer Back Up Report

Description: A summary of events and causes for sanitary backups on January 11, 2020 on Lori Blvd, Lindsay

Ward Number: 5

Author and Title: Amber Hayter, Supervisor, Water & Wastewater Operations

Recommendation(s):

That Report WWW2020-004, **Sanitary Sewer Back Up Report**, be received.

Department Head: _____

Financial/Legal/HR/Other: _____

Chief Administrative Officer: _____

Background:

At the Council Meeting of January 28, 2020 Council adopted the following resolution:

CR2020-023

Moved By Councillor Dunn

Seconded By Councillor Yeo

That the Memorandum from Councillor Dunn, regarding a **Sanitary Sewer Back-up**, be received; and

That staff prepare a report that identifies the cause of the sanitary sewer back up, during an extreme weather event, that impacted Northern and Eastern portions of Ward 5 on January 11th, 2020 and report back to Council by the end of Q2, 2020.

Carried

This report addresses that direction.

On January 11th, 2020 an extreme weather event occurred throughout the City of Kawartha Lakes. Rainfall in the area was recorded at approximately 60 mm, which fell in a relatively short period of time. In addition to significant amounts of rainfall, warmer than seasonal temperatures also caused significant snow melt to occur. There were reports of flooding in many areas throughout the City due to the excessive rain and snow melt. Unfortunately, a number of homes in Lindsay also experienced sanitary sewer backups.

As identified in the sanitary sewer presentation that was presented to Council on July 28, 2020, as attached, there are a number of potential causes for sanitary sewer backups. They may include, blockages within the individual properties' sanitary lateral caused by roots, grease, non-flushable items, excessive flows caused by infiltration and inflow, and buildup of calcite around cracks and leaks in a pipe.

During large rain events flows in sanitary sewer systems often increase significantly due to various sources of infiltration and inflow (I&I). Inflow is where source water is capable to flow directly into a sewer system. A significant source of inflow is often illegal connections from private property owners of their roof drains, sump pumps and foundation drains to the sanitary sewer system. Other sources of inflow are from road surfaces when roads become flooded and water enters the system through the tops of manhole lids. Infiltration is where extraneous flows enter the system via groundwater such as through cracks in pipes and manhole structures. This type of excess flow however is often delayed

and higher flows are experienced often for a few days after a storm event as the water saturates the ground.

Sanitary sewers are designed to accommodate a specific capacity of flow based on population for the contributing areas, only a small percentage is incorporated into the sizing to accommodate I&I. Sanitary sewers cannot be oversized as they would not function properly during normal flow conditions. Pipes are sized to ensure that flows maintain a certain velocity in order to keep pipes clear of buildup. Gravity sewers are also designed and installed at certain elevations, in order to ensure there is a proper amount of slope to maintain adequate flow velocity.

Rationale:

The backups that occurred in the Northern and Eastern portions of Ward 5 within the Town of Lindsay on January 11, 2020 were the result of surcharging within the sanitary sewer collection system. The system saw an overall increase in flows of approximately 5.5 times the normal daily flow. The overall recorded flow from the sewage pumping stations in the Lindsay Wastewater Collection on January 11th was 67,744 m^3 compared to 12,724 m^3 on January 10th. Staff who responded to the emergency event did identify that the collection system in the area of the backups and upstream of that was overwhelmed with significant flows, primarily of which was clear water.

Staff performed an investigation in the weeks following the event with the help of a contractor to determine any potential causes of the backup, other than the extraneous flows. The system was flushed and camera inspected by CCTV. There were a few minor deficiencies identified in manholes and sewer lines, such as cracking in the structure and calcite buildup in sewers. The cracked sewer lines would have had minimal impact on the amount of flow in the pipe. The calcite buildup had no impact on the normal flow within the pipe, due to its location, and therefore would not have been identified until the next cycle of sanitary sewer flushing. The calcite was removed by the contractor following the inspection.

It was determined that the primary cause of the backups was the drastic increase in sanitary sewer flows, contributed to by the extreme weather event (intense rain combined with snow melt). The collection system became overwhelmed and was not able to handle the amount of wastewater flowing through the system, resulting in the homes at the lower elevation in the system to backup.

Maintenance is regularly performed on all sanitary sewer collection systems, which includes manhole inspections, sewer flushing, grouting, replacements, and CCTV inspections. Flushing of the entire sanitary sewer system is performed every four years, with dead-ends and problem areas flushed on an annual basis. This frequency exceeds industry standards, but is important to ensure pipes are kept clean and to mitigate any issues such as backups. Annually, there is a

program in place to perform manhole maintenance which includes grouting and sealing of cracks, replacement of manhole moduloc, frames and covers, all helping to reduce the amount of infiltration. Rain bladders are also installed in manhole lids where they are located in lower areas within a road surface, preventing water from entering the holes in the top of manhole lids. CCTV inspections are performed in advance of capital improvements and on an as needed basis. CCTV inspections are quite costly, and therefore it is not economically viable to perform on a regular maintenance schedule.

By-law 2016-006 “A By-law to Establish Management and Use of Sewer Works”, prohibits the discharge of “storm water, ground water, roof drainage or water from building foundations, storm water leaders, downspout, sump pumps, watercourses or dewatering” into the sanitary sewer systems. Although the by-law prohibits the discharge, there is no formal program in place to enforce and assist property owners with the disconnection of illegal connections. The largest portion of excess flows into the sanitary sewer system comes from these types of illegal connections from private homes/businesses.

To prevent future backups individual property owners can install a backwater valve on their sanitary sewer lateral that comes to their house, which will prevent sewage from backing up into their basement. More information on backwater valves is included in Council report WWW2020-005 Flood Prevention Subsidy Report.

Implementation of a Disconnect Program could be developed to help eliminate illegal connections, and reduce the risk of sewer surcharging during extreme weather events, however would require resources from other City Departments such as Engineering, Building and By-law. Additional costs to the City and the property owners would be incurred in order to successfully implement, administer and enforce this program. Although disconnecting connections from the sanitary sewer systems would alleviate the risk of sewer backups caused by extraneous flows, it poses additional challenges on other infrastructure such as providing appropriate storm sewers and ditches to handle the water. Re-directing flows improperly could result in flooding or icing of properties and roadways which could have negative implications. A combined presentation on Mandatory Connection and Sanitary Disconnect was presented to Council in 2014 as a Black Belt initiative. Follow up to the presentation was the implementation of the Mandatory Connection program, no further action was taken regarding the sanitary Disconnect Program.

Other Alternatives Considered:

The purpose of this report is to provide information to Council, however Council could choose to adopt the following resolution that would direct staff to explore a sanitary sewer disconnect program:

That staff be directed to review the development and implementation of a sanitary sewer disconnect program and report back to Council by the end of the Q1 2021.

Financial/Operation Impacts:

There are no financial or operational impacts from the recommendations in this report. Should Council choose to implement a sanitary sewer disconnection program, costs will need to be identified by required departments in a subsequent review and report to Council.

Relationship of Recommendation(s) To The 2020-2023 Strategic Plan:

The recommendation to Council is consistent with the Council Adopted Strategic Plan in the following ways:

“Good Government” – this report clearly identifies that operations are continually striving to meet this strategic priority by ensuring that municipal assets are well maintained and well managed. The priority is also met by continuing to ensure services are delivered efficiently and effectively.

“Healthy Environment” – the operations and maintenance of municipal wastewater systems in compliance with regulations, continues to ensure that water quality is protected and enhanced.

Consultations:

Director of Public Works

Insurance Risk Management Coordinator

Director of Engineering & Corporate Assets

Attachments:

Appendix A
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Department Head: Bryan Robinson